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June 10, 2019

PLANNING BOARD
GRAFTON, MA

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Town Planner
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EXHIBIT 19

**Subject: "Meadowbrook Manor"
15 Meadowbrook Road
Definitive Plan Review**

Dear Joe:

We received the following documents in our office on June 5, 2019:

- Correspondence from Summit Engineering & Survey, Inc. to Grafton Planning Board dated June 5, 2019 re: Revised Subdivision Plans, Application for Approval of Definitive Subdivision Plan, 15 Meadowbrook Road.
- Plans entitled Definitive Subdivision Plan of "Meadowbrook Manor" dated March 14, 2019 and last revised June 4, 2019, prepared by Summit Engineering & Surveying, Inc. for Robert G. Flynn Sr. (7 sheets)

Graves Engineering, Inc. (GEI) has been requested to review and comment on the plans' conformance with applicable "Rules and Regulations Governing the Subdivision of Land; Grafton, Massachusetts" revised through April 27, 2009; "Grafton Zoning By-Law" amended through May 14, 2018, Massachusetts Department of Environmental Protection (MassDEP) Stormwater Handbook and standard engineering practices.

This letter is a follow-up to our previous review letters dated May 3, 2019 and May 20, 2019. For clarity, the comments from our previous letters are *italicized* and our latest comments to the design engineer's responses are depicted in **bold**. For brevity, comments previously addressed by the design engineer and acknowledged by GEI have been omitted. Previous comment numbering has been maintained.

Our comments follow:

Zoning By-Laws

1. *GEI reviewed the plans for conformance with the Zoning Bylaw and found the plans to be in order.*
No further comment necessary.

Subdivision Rules & Regulations

2. *GEI reviewed the waiver requests submitted with the application package and has no engineering-related concerns except as noted in the following comment.*

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No further comment.

3. *There is no levelling area for the proposed roadway; there is a proposed 5.8% grade where the subdivision roadway intersects Meadowbrook Road. The 5.8% grade is steeper than the existing grade. A levelling area of 100 feet with a maximum grade of 3% is required and a waiver was requested. The design engineer should perform an analysis of the vertical alignment of the intersection and demonstrate that the Fire Department's ladder truck (which has a long chassis overhang at the rear of the vehicle) can enter and exit the subdivision road without the vehicle's overhang striking the ground. If not already done, the Planning Board may wish to solicit comments from the Fire Department relative to the proposed subdivision. (§4.1.5.6.a & §4.1.5.3)*

May 20, 2019

GEI understands that a site visit by the Fire Department with the ladder truck was scheduled for the evening of May 15, 2019 to test the grade change at the intersection. GEI is not aware of the findings from that site visit.

Acknowledged. *The vertical alignment was revised (e.g. the proposed elevation was lowered by approximately one foot at the front property line) and a "Fire Truck Approach Detail" (the "Detail") was added to Sheet 5. GEI measured the dimensions of Grafton Fire Department's Tower 1 apparatus and concurs with the findings in the Detail.*

4. *The plans need to identify the proposed materials and dimensions of the bounds along the right-of-way. (§3.3.3.10 and §4.8.1)*

May 20, 2019

The design engineer responded material and size specifications were added to the plans and that a waiver was requested to allow for reinforce concrete bounds in lieu of granite. GEI could not find reference to the bound materials anywhere on the plans. GEI understands that waiver requests will be addressed by the Planning Board.

9. *Whereas the plans propose construction of a way essentially in accordance with common driveway requirements, the Planning Board should consider conditioning its decision such that the Town will not become responsible for ownership and maintenance of the road. Such construction would require road maintenance services that are more demanding than standard subdivision streets (e.g. maintenance of roadside swales, less maneuvering area for snow removal equipment at the turnaround).*

No further comment necessary.

Hydrology & MassDEP Stormwater Management Review

11. *The HydroCAD model of the stormwater basin includes orifices at elevations 392.35, 392.75 and 393.25 feet that were not shown on the construction detail of the outlet control structure. The model also includes an outlet weir that is not identified on the plan or detail. The information on the plans and in the HydroCAD model needs to be coordinated and the basin must have an emergency spillway.*

May 20, 2019

The orifice information was coordinated between the plans and the HydroCAD model. A spillway was added to the plans and the HydroCAD model. GEI has no issue with the

design intent of the spillway but the plans need to be revised to include the elevation of the spillway (395.75 feet in the HydroCAD model).

General Engineering Comments

20. *At the end of the road, there must be a vehicle turnaround whereby the cross-slope of the vehicle is no greater than 4% throughout the turnaround maneuvers. This is typically accomplished by setting the road centerline grade to no more than 4% through a turnaround. The road centerline grades are up to approximately 5% at the turnaround.*

May 20, 2019

No revisions to the existing grades are proposed; the design engineer cited the existing pavement grade dictates the cross-slope. We stand by our recommendation of a 4% maximum grade through the turnaround but will yield to the Fire Department if the Fire Department is satisfied with the existing grade and provision for maneuverability by emergency vehicles.

Acknowledged. The spot grades on Sheet 5 show a maximum cross-slope of 3.89%.

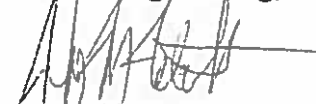
General Comments

29. *The plans show wetlands along the northern boundary of the property, along the existing gravel driveway in the middle of the site, and at the intersection of Meadowbrook Road. These wetlands were not shown on the preliminary plans, and while there is no disturbance to the northern and central wetlands, there is proposed grading within the 25-foot "no alteration" buffer of the wetlands near Meadowbrook Road. GEI understands that any alterations to the wetlands or the buffer zones will be reviewed by the Grafton Conservation Commission.*
No further comment.

30. *The plans show a total of approximately 114,000 square feet of earth disturbance broken-down as follows: right-of-way and drainage basin – 55,000± sq. ft.; Lot 1 development – 30,000± sq. ft. and Lot 2 development – 29,000± sq. ft. Whereas the three areas constitute one development project and the amount of disturbance is greater than 40,000 square feet, it seems that the project must comply with the Grafton Stormwater Bylaw and Stormwater Regulations administered by the Conservation Commission. GEI did not review the project for compliance with regulations administered by the Conservation Commission but can perform such a review if the Commission so desires.*
No further comment.

We trust this letter addresses your review requirements. Feel free to contact this office if you have any questions or comments.

Very truly yours,
Graves Engineering, Inc.



Jeffrey M. Walsh, P.E.
Principal

cc: Andrew Baum, P.E.; Summit Engineering & Survey, Inc.